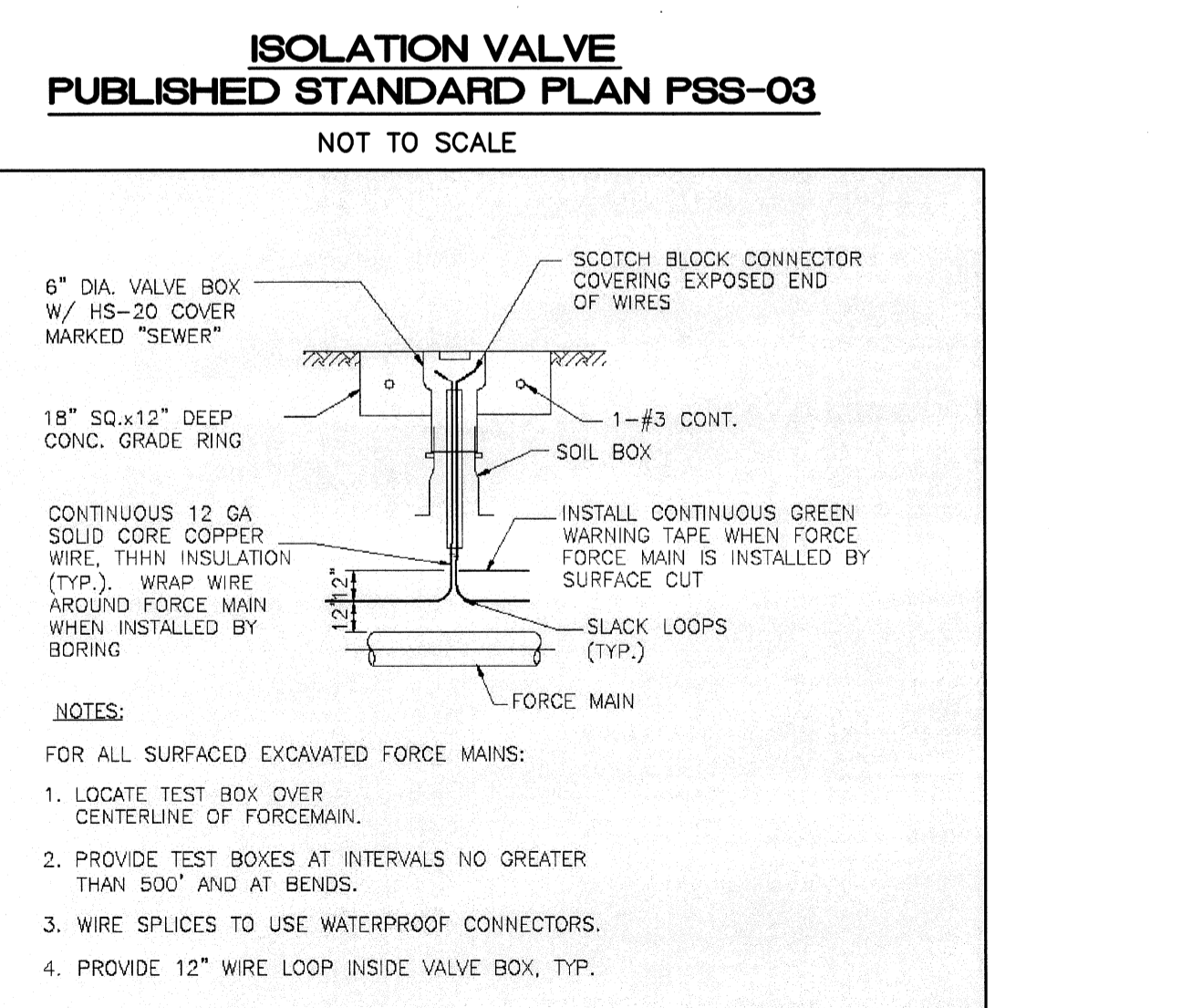
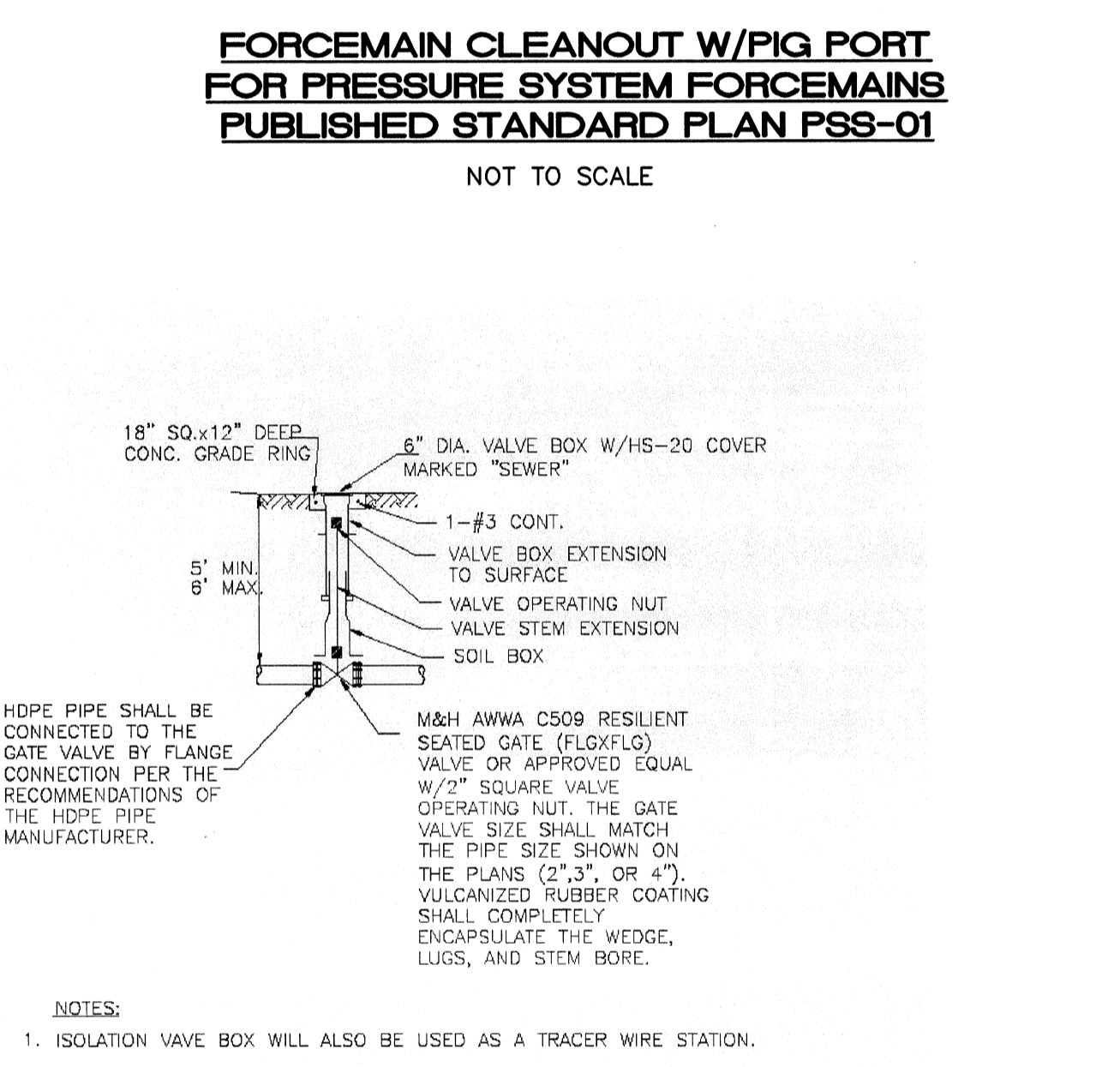
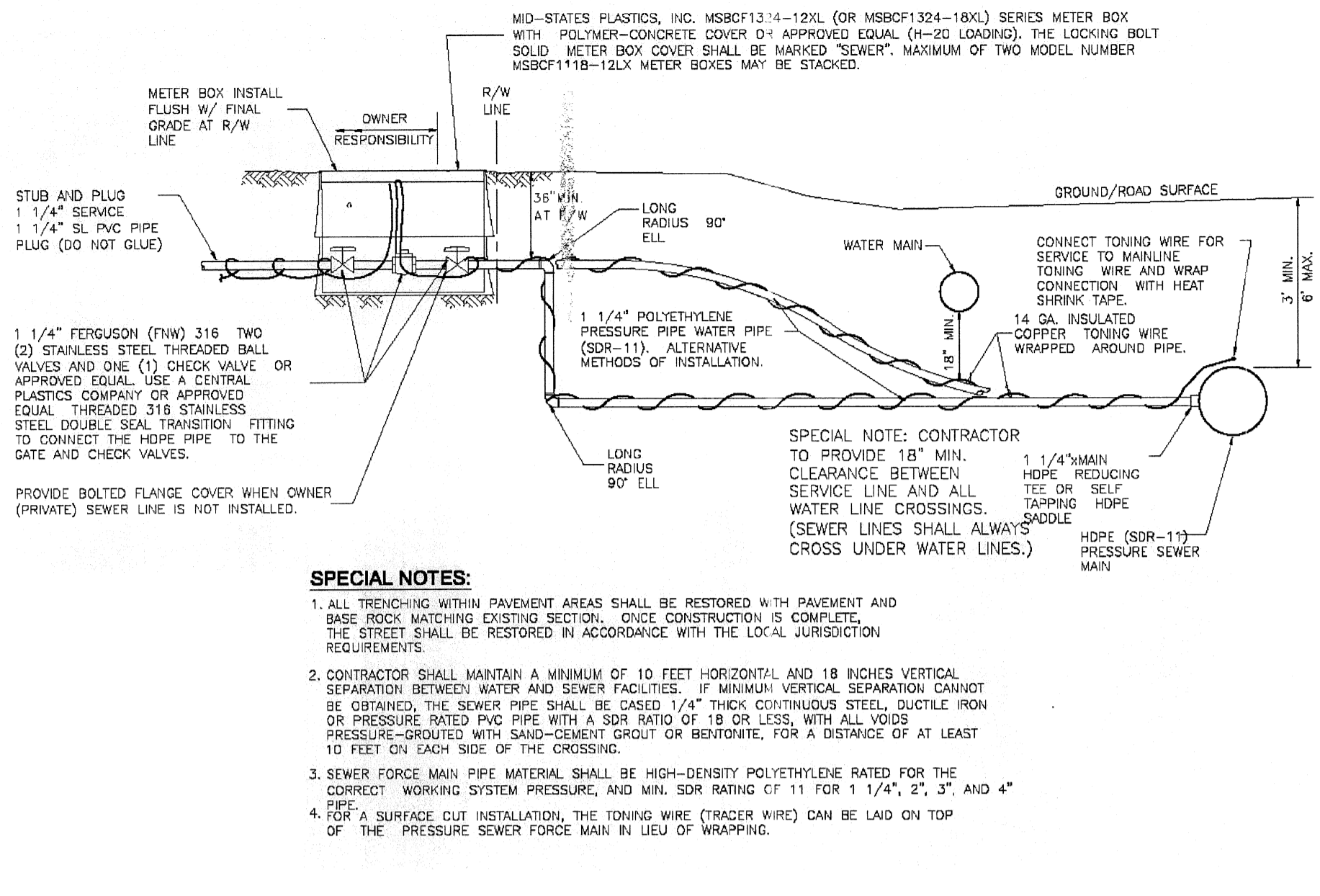
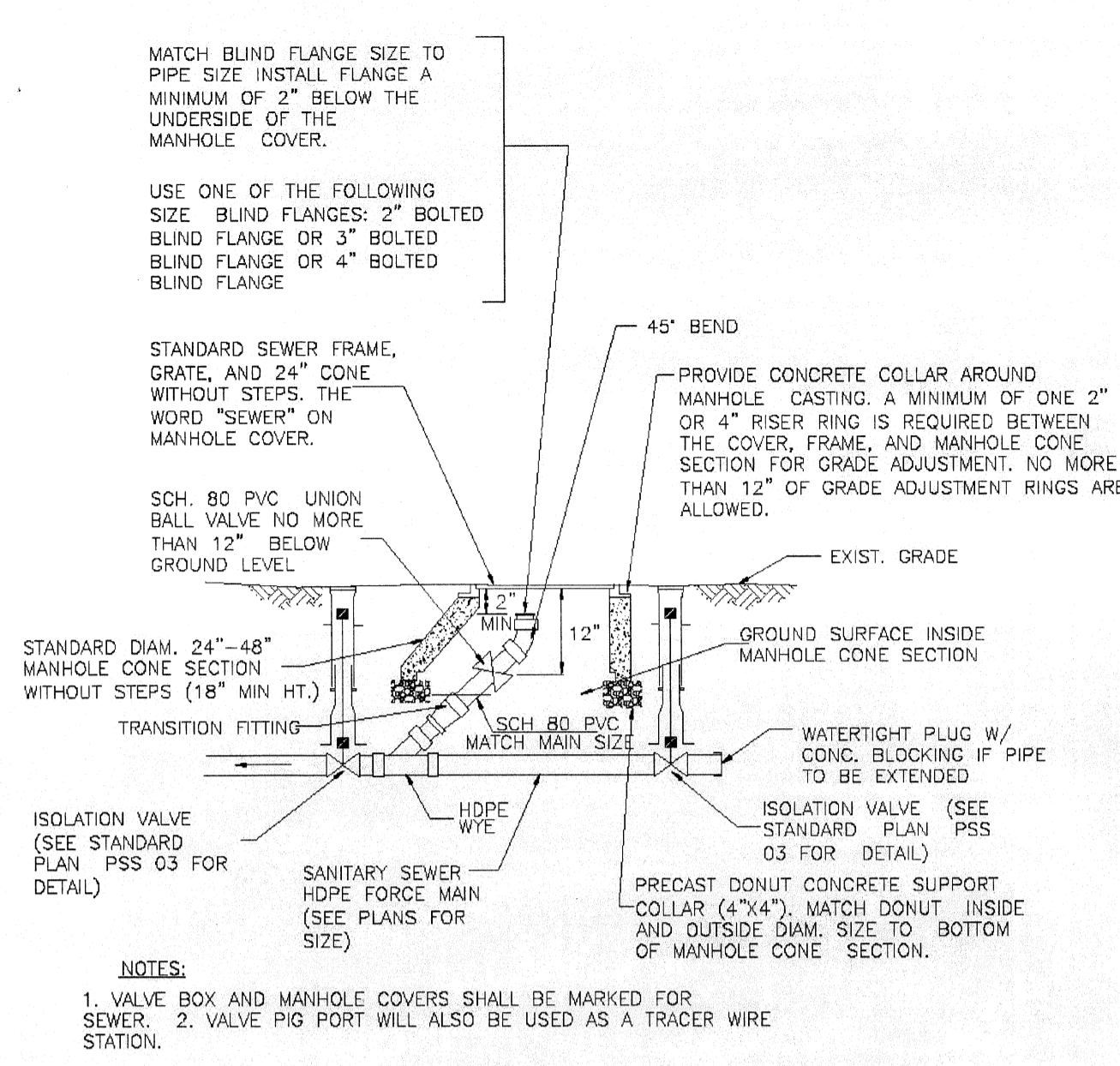
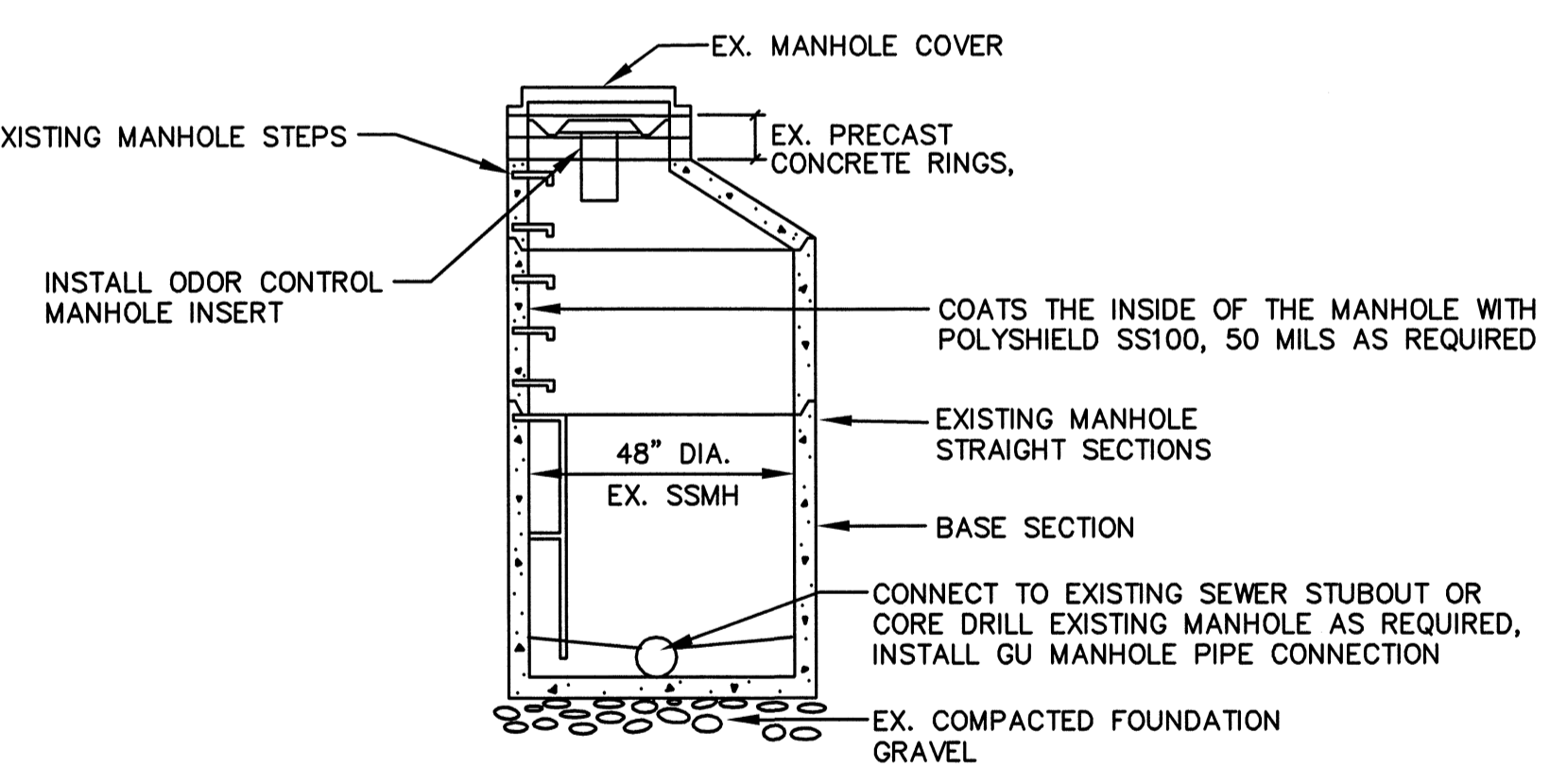
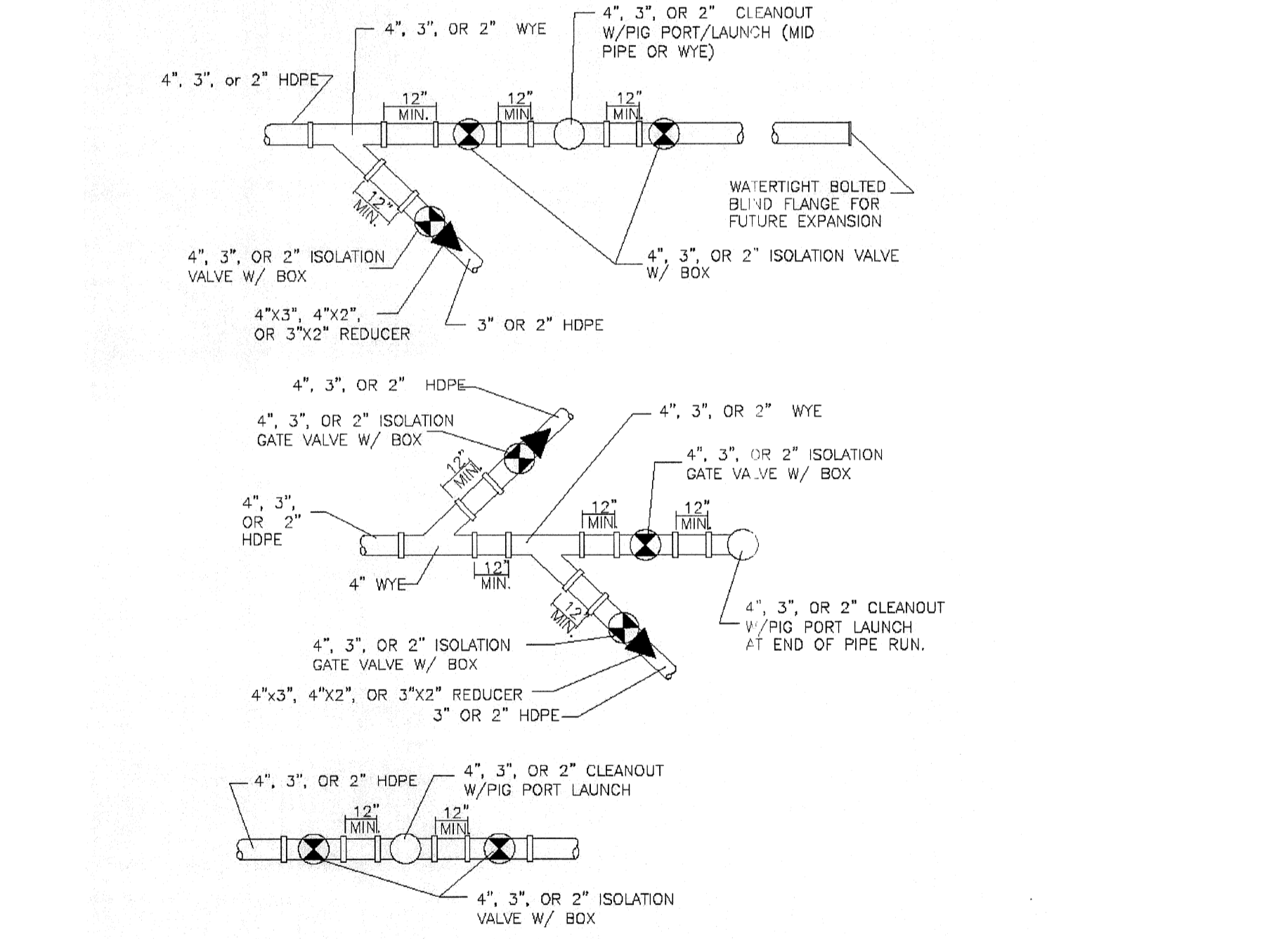


N.W. 1/4, SEC. 26, T. 21 N., R. 4 E., W.M.



- LAKEHAVEN UTILITY DISTRICT STANDARD NOTES FOR PRESSURE SEWER CONSTRUCTION**
1. All work and materials shall conform to the Washington State Department of Transportation/Washington State Chapter American Public Works Association (WSDOT/APWA) "Standard Plans for Road, Bridge and Municipal Construction" November 1996 Edition, and the standards of Lakehaven Utility District.
 2. Contractor shall verify the location of all utilities that may be affected by this work and shall notify appropriate utility companies to field-locate their facilities before starting any excavation, in accordance with RCW 19.122.
 3. Connections of new pressure sewer mains to existing facilities shall be temporarily sealed off until after upstream construction is tested, cleaned, and accepted. All construction debris and water shall be removed prior to opening the seal without flushing the debris downstream.
 4. Pressure sewer pipe material shall be as shown on the Plans, which will be one of the following and not necessarily interchangeable:
 - High Density Polyethylene (HDPE) ASTM D-148, thermal butt-fused joints, minimum DR 11
 - Ductile Iron ANSI A 21.51/AWWA C-151, minimum Class 52, epoxy-lined with Protecto 401 Ceramic Epoxy
 5. Crushed surfacing top course (a.k.a. 5/8" crushed rock) shall be used for pipe bedding for rigid and flexible pressure sewer pipe. The material shall be placed under the pipe to a compacted depth of 4" (for 27" and smaller pipe), and to a compacted depth of 6" (for pipe greater than 27"). The material shall be placed 6" over the top of flexible pipe and to the springline of rigid pipe. To assure uniform support, the material shall be carefully worked under the pipe haunches with a tool capable of preventing the formation of void spaces around the pipe.
 6. All trench backfill shall be compacted to 95% of relative density, or greater if so shown on the Plans or otherwise required by the road agency having jurisdiction, from the bottom of the excavation to the surface. Developer shall be responsible for all costs incurred for compaction testing.
 7. Unless otherwise shown on the Plans, pressure sewer mains shall be installed with cover over the pipe between five feet (5') and six feet (6').
 8. Pressure sewer mains shall not have any single bend that exceeds forty-five degrees (45°). For pipeline deflections that exceed 45°, a spool is required between multiple bends. The spool length between bends shall be a minimum of four (4) times the diameter of the pressure sewer main.
 9. Pressure sewer mains and stubs shall be hydrostatically pressure tested at one and one-half (1 1/2) times the working design pressure of the system or 100 psi, whichever is greater. The trench backfill shall be compacted prior to pressure testing the pipe. Side sewer stubs shall be tested at the same time as the pressure sewer mains.
 10. All Isolation Valves, Cleanouts / Pig Ports, and Pressure Side Sewer Stubs shall conform to Lakehaven Standard Plans.
 11. Pressure sewer mains and the side sewer stubs shall be wrapped with tracer wires, and Tracer Wire Location Stations shall conform to Lakehaven Standard Plans.
 12. Connecting manholes shall conform to WSDOT/APWA Standard Plan B-23a, Type 1 or Type 2 with eccentric cones, and include 1-inch galvanized drop safety steps or polypropylene safety steps (Lane International Corp. Part No. P-14938) and at least one (1), and no more than five (5), four-inch (4") high adjustment rings below the frame and cover. All manhole exterior surfaces shall receive a protective coating of bituminous coal tar to a minimum thickness of 50 mils, applied at the factory. Where noted on the Plans, manhole interior surfaces shall receive a corrosion protective epoxy coating of Polyshield SS-100 (by Specialty Products, Inc. of Tacoma; 50 mils minimum thickness) or Ravin 405 (by Ravin Lining Systems of Tulsa; 100 mils minimum thickness). All coatings shall be applied in accordance with the manufacturer's instructions.
 13. Connecting manhole frames and covers shall be cast iron, with the word "SEWER" cast in the top, shall weigh 140 to 150 pounds, and shall have a single 1-inch lift hole fitted with one 3/4" X 3" galvanized carriage bolt with burred end to retain the nut and a flat washer to allow for 1" bolt travel. Covers shall be 25" in diameter.
 14. Concrete collars reinforced with wire mesh shall be installed per Lakehaven Standard Plan where shown on the Plans.
 15. Connecting manhole channels shall be produced to the full depth of the associated pipe diameter, and to a width no less than the outside diameter of the associated pipe and no more than 1/2-inch in excess of the outside diameter of the associated pipe. Connecting manhole channels shall have a smooth finish. To minimize turbulence, side channels from inlet pipelines shall be curved toward the outlet pipeline to provide a smooth laminar flow transition from all inlet pipelines to the outlet pipeline. Channel material shall be a shrink-resistant grout mix, using 6 sacks per cubic yard Portland cement and 7/8" graded aggregate.
 16. Connecting manhole shelves shall have a broom finish, and be sloped 1/2-inch to 1-inch per foot toward the channel.
 17. Pipe ends of all inlet and outlet pipelines shall not extend more than 2 inches inside the connecting manhole, and all penetrations shall be smoothly grouted around the pipe with shrink-resistant grout.
 18. No joints for flexible pipe inlets and outlets shall be within 10 feet of the connecting manhole, and pipelines shall be connected to the connecting manhole with PVC manhole collars. Rubber boot collars are prohibited.
 19. The termini of pressure sewer stubs shall be capped and marked by a white 2X4 post labeled "Sanitary Side Sewer;" (April 28, 2005)



NOTE:
UP TO 6" PIPES, FITTINGS, VALVES AND CLEANOUTS ARE USED FOR THIS PROJECT.
ALL PRESSURE SIDE SEWER LATERALS ARE 1.5" HDPE DR11 PIPES MATCHING THE MATERIALS OF THE MAIN LINES.

LAKEHAVEN UTILITY DISTRICT
O Water Plan **8/24/10** Sewer Plan
Date
APPROVED FOR CONSTRUCTION
SUBJECT TO CHANGES NOTED
The District's review is not a check of any dimension or quantities and will not relieve the Developer from responsibility for errors of any sort. No changes shall be made in the plans except by the consent of the District.
General Manager/District Engineer **9/23/10** Date
This construction plan will expire one year from plan approval date, if construction has not commenced.



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FAX: (206) 388-1648
WEB SITE: PACENG.COM
Civil Engineering and Planning Consultants

LAKEHAVEN UTILITY DISTRICT PROJECT NO. 6304025
PEPPER HILL ESTATES
KING COUNTY, WA.
FOR PACIFIC HOUSING GROUP I, LLC
14000 15TH AVE S.
SEATTLE, WA 98107-6346
PHONE: (206) 921-5979 . FAX: (206) 224-2880

PROJECT NO.: 05052
DRAWN BY: JGC
ISSUE DATE: 09-30-05
SHEET REV.: 08-24-10

FORCE MAIN SANITARY SEWER DETAILS

